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AKD 00085 0701

Flint Hills Resources Alaska LLC, North Pole

4A - Inspection Reports & Compliance Monitoring



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COMPLIANCE EVALUATION INSPECTION REPORT

MAPCO Alaska Petroleum Inc.

AKD 00085 0701

1100 H & H Lane

North Pole Alaska 99705-7899

Date inspected: May 27, 1994



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ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
RCRA COMPLIANCE EVALUATION INSPECTION  
AND CLOSURE VERIFICATION REPORT

AK 0701  
1E  
5/27/94  
↓  
4a

Facility Name: MAPCO Alaska Petroleum Inc.

EPA Identification Number: AKD 00085 0701

Facility Location: 1100 H & H Lane  
North Pole, Alaska 99705-7899

Facility Mailing Address: Same as facility location

Facility Telephone Number: (907) 488-2741

Facility Representatives: Kathleen McCullom  
Environmental Supervisor  
(907) 488-0033

David Rowse  
General Manger

Date of Inspection: May 27, 1994

Date of Report: July 12, 1994

Inspector's Name: Kristen DuBois Goodwin  
Environmental Specialist  
Lead inspector & report writer  
Alaska Department of Environmental Conservation  
610 University Ave.  
Fairbanks, Alaska 99709-3643  
(907) 451-2131

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Geoffrey Kany  
Environmental Engineering Associate  
Alaska Department of Environmental Conservation  
410 Willoughby, Suite 105  
Juneau, Alaska 99801-1795  
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### Facility Background and Compliance History:

MAPCO Alaska Petroleum Incorporated (MAPI) operates as an oil refinery in North Pole, Alaska. The facility is located on approximately 240 acres of land leased from the State of Alaska. The active portion of the facility encompasses approximately 4 acres.

MAPI receives crude oil from the Trans Alaska Pipeline System (TAPS). Residual portions of the feedstock not utilized in the facility's process is returned to TAPS. The refinery began operating in 1977 with an initial intake of 30,000 barrels of crude oil per day. Presently, after many modifications, MAPI is capable of running 130,000 barrels per day of crude oil through the refinery and producing over 40,000 barrels per day of petroleum products. MAPI produces home heating oil, diesel and jet fuels, gasoline (leaded and unleaded) and asphalt.

Approximately 60% of the refined products are transported off-site via rail. The remaining 40% is transported via truck.

The facility has two crude units, Crude Unit #1 & #2. Each of these units are shutdown annually for general maintenance and cleaning. Under normal operating conditions the facility operates 24 hours a day, 365 days a year.

On March 5, 1987, MAPI was subject to a non-notifier RCRA Compliance Evaluation Inspection (CEI). Numerous hazardous waste management violations were observed during this inspection including illegal disposal of seven drums of Navy Brand Solvent. This solvent contained >11.2% 1,1,1 trichloroethane and 35.8% methylene chloride and was reportedly disposed of in the facility's sump system sometime between April 1986 and March 1987. As a result of the March 1987 inspection, EPA issued the facility a 3008(a) Complaint and Compliance Order on January 27, 1988. A Consent Agreement and Final 3008(a) Order was signed by the facility on December 29, 1988 and by EPA on January 6, 1989. The 3008(a) Order carried a \$80,000 penalty.

The facility also signed an Administrative Order on Consent under Section 3008(h) of RCRA on December 29, 1988. This Order was signed by EPA on January 6, 1989. The 3008(h) Order identified Tank 192, Lagoon B, the boneyard, and Sumps 901, 905, 909b and 05-7 as units that received regulated hazardous waste and required MAPI to conduct an Interim Measures program to remove hazardous waste constituents from these units. As required by the 3008(h) Order, MAPI also completed several tasks including: 1) a Description of Current Conditions report; 2) Pre-Investigation Evaluation or Corrective Measure Technologies Study; 3) Interim Measures Workplan; 4) RCRA Facility Investigation (RFI) Workplan; and 5) a RFI. The Order stipulated that MAPI conduct a Corrective Measures Study (CMS) dependent upon and in accordance with whatever findings may be determined by the RFI. EPA never approved the RFI in writing and a CMS has never been conducted.

As required by the 3008(a) Order MAPI completed the following tasks: 1) a Procedures and Methods to Assure Compliance with 40 CFR 262 Regulations report; 2) Waste Analysis Plan; 3) Inspection and Recordkeeping Procedures for the Boneyard Hazardous Waste Drum Storage Area report; 4) Pre-closure Investigation report which addressed Tank 192, Lagoon B, the Boneyard, and Sumps 901, 905, 909b, and 05-7; 5) a Closure Plan for Tank 192, Lagoon B, the Boneyard, and Sumps 901, 905, 909b, and 05-7 submitted to EPA in February 1990; and 6) Closure Certification and Procedures for Tank 192, Lagoon B, the Boneyard, and Sumps 901, 905, 909b, and 05-7 submitted to EPA in October 1991.

MAPI elected to implement the Closure Plans in 1990 and to certify closure prior to EPA Closure Plan approval. At the time of this inspection, the Closure Plans and Closure Certification for the above referenced units were on Public Notice for 30 days. The Public Notice period ended on June 17, 1994 and no public comment was received by EPA. EPA approved the Closure Plans in a June 30, 1994 letter to MAPI.

In addition to the above mentioned EPA Orders, the facility is also operating under a 1986 ADEC Compliance Order which addresses the cleanup of floating product and dissolved hydrocarbons in the groundwater. This contamination primarily resulted from product spills and leaking sumps and tanks since 1977. MAPI installed several recovery wells and as of this date, has recovered approximately 300,000 gallons of petroleum product. Recovered product is rerefined and the remaining water fraction, with benzene concentrations of 300-400 ppb, is treated in air stripping towers prior to discharge to gravel pits and a leachfield system. The wastewater discharge is covered under an ADEC Wastewater Disposal permit. As a permit condition, benzene levels in the treated wastewater must not exceed 5 ppb.

Upon EPA approval of the submitted closure plans, the 3008(a) Order is nearing termination. It is questionable as to whether the 3008(h) Order should be terminated by EPA since no CMS has been conducted and since hazardous constituents above health based criteria remain in the soil and groundwater at the facility. EPA may elect to terminate the 3008(h) Order nonetheless since the cleanup of floating product and dissolved hazardous constituents is being addressed under the ADEC Order.

Since the 1987 CEI, MAPI has been subject to a RCRA Facility Assessment in July 1988; a Corrective Action Oversight inspection in July 1989 and June 1990; a Comprehensive Groundwater Monitoring Evaluation by PRC, EPA's contractor, in May 1990; and Compliance Evaluation Inspections in 1989, 1990, 1991, 1992 and 1993. A State NOV was issued to MAPI on October 9, 1990 as a result of the June 20, 1990 CEI.



## **Introduction and Record Review:**

The inspection team arrived at the MAPI facility at 10:45 a.m. on May 27, 1994 where they met with Ms. Kathleen McCullom, MAPI's Environmental Supervisor. The facility was provided prior notification of the inspection by Ms. Kimberly Ogle of EPA Region 10. The inspectors explained the purpose of the inspection and presented their EPA inspector credentials to Ms. McCullom. Ms. McCullom informed the inspectors that MAPI recently developed a special Environmental Section of which she is the supervisor. The new Environmental Section has two additional positions. One position is presently occupied by Ms. Jeanne Brodie and the other position has yet to be filled.

The inspectors began the inspection by asking Ms. McCullom about the status of MAPI's 3008(a) and 3008(h) orders. Ms. McCullom stated that it is the facility's understanding that they will have fulfilled all of the 3008(a) and 3008(h) requirements once EPA has approved the facility's Closure Plan and Certification of Closure. The inspectors discussed the various potential issues regarding the termination or amendment of the Orders and all parties agreed to coordinate discussions regarding this issue with EPA.

Ms. McCullom stated it is MAPI's position that they are a generator of hazardous waste and should not be considered an interim status hazardous waste management facility under RCRA. Language in the March 21 1989 RCRA CEI indicates that EPA concluded the facility should be viewed as a generator of hazardous waste and not a treatment, storage or disposal facility. MAPI, however, is still subject to the EPA Orders which include some 40 CFR 264/265 requirements. Additionally, MAPI did operate a surface impoundment and thus should be considered a "land disposal facility" as defined in RCRA §3004(k).

Ms. McCullom explained that under normal operating conditions MAPI is a Small Quantity Generator (SQG), however, during the month of May 1994 they are a Large Quantity Generator (LQG) due to turnaround of Crude Unit #2. General maintenance and cleaning of the crude units occurs during turnaround. Regulated hazardous waste primarily produced during turnaround includes desalter sludge (D001 & D018), heat exchanger bundle cleaning sludge (K050), and petroleum refinery primary oil/water/solids separation sludge (F037).

Ms. McCullom designates the solids removed from trenches throughout the refinery as F037. These trenches receive captured precipitation and some process wastewater. The trenches lead to sumps which then lead to Tank 192, a oil/water separator. Recovered fuel from Tank 192 is rerefined and the associated water is passed through air strippers and then discharged to a series of treatment lagoons, Lagoons A, B & C. According to Ms. McCullom, Lagoon A provides an aggressive biological treatment to the wastewater. Sump 912A receives treated wastewater from Lagoon C and the

wastewater is then discharged to the City of North Pole's POTW. Sump 912A replaced the function of Sump 909b. Sump 909b is now used during the transfer of wastewater from Lagoon B to Lagoon C.

The inspectors asked Ms. McCullom how MAPI manages their used oil. Ms. McCullom stated that the facility generates limited quantities of used oil and they presently market it to Seekins Ford Lincoln Mercury in Fairbanks where it is burned for energy recovery. Ms. McCullom stated that MAPI has considered rerefining their used oil but have not spent much time researching this issue. Ms. McCullom was informed by the inspectors that accumulation time requirements are not applicable to used oil and that MAPI could store their used oil on-site until they have researched reinjection to the refinery under the presumption that the used oil will be recycled/reclaimed.

In an effort to alleviate some of MAPI's hazardous waste management problems, Ms. McCullom stated that chlorinated compounds are not used at the facility anymore. This ban on the use of chlorinated compounds extends to contractors doing work on-site.

#### **Record Review:**

Review of MAPI's pertinent RCRA records occurred after the facility tour but will be presented in this portion of the report.

Hazardous waste manifests were randomly selected from 1991 to present for review. All manifests and their associated Land Disposal Restriction forms (LDRs) reviewed appeared to meet the requirements of 40 CFR 262 and 268.

The RCRA Contingency Plan as required by 40 CFR 265 Subpart D as referenced by 40 CFR 262.34(a) is not one separate plan but a conglomerate of the Emergency Preparedness and Disaster Control Plan dated May 1989, the MAPCO Oil Discharge Prevention and Contingency Plan dated September 1991 and the Procedures and Methods to Assure Compliance with 40 CFR 262 Regulations document dated January 1991. It appears upon brief review that these documents meet the requirements of 40 CFR 265 Subpart D.

The 1991 and 1993 Hazardous Waste reports were on file.

Each MAPI employee is subject to comprehensive safety and hazardous waste/materials training that appears to meet the 40 CFR 265.16 requirements as referenced by 40 CFR 262.34(a). MAPI uses a computer program which tracks each employees training. Ms. McCullom stated that she had recently undergone Incident Command System (ICS) and General Site Supervisor training.



### Facility Tour:

Photographs were taken throughout the facility tour by Ms. DuBois Goodwin with a Samsung 35mm camera and 100 & 200 ASA Kodak film. Photographic documentation is located in **Appendix A**.

The facility tour began after lunch at approximately 1:30 p.m. Ms. McCullom first lead the inspectors through Crude Unit #2. No hazardous waste accumulation areas were observed in this area. Ms. McCullom pointed out Sump 05-9 and monitoring well (MW) 115. Both of these are adjacent to Crude Unit #2 and the Blending and Metering Building, **Photo #1**. Sump 05-9's inflow is primarily from the Blending and Metering Buildings floor drains. Groundwater in this area has a slight product sheen, according to Ms. McCullom.

Next we visited the Control Building or Operations Station. A "red phone" is located in this building which is capable of automatically calling the North Pole Fire Department and all on-call emergency response MAPI employees, in the event of an emergency.

Ms. McCullom then lead the inspection team to Crude Unit #1 and pointed out Sump 901 and MW 116, **Photo #2**. Ms. McCullom stated that Sump 901 receives wastewater from Sump 05-9, process wastewater and stormwater run-off. Sump 901 was the first sump ever installed at the facility. Sump 901 is located in the middle of a product plume on the groundwater, according to Ms. McCullom.

While at Crude Unit #1, the inspectors observed a black substance in the process skid trenches, **Photo #3**. Ms. McCullom stated that this material is managed as F037 hazardous waste and that the facility generates approximately one 55-gallon drum per year. In this area, we also observed a large plastic fish tote filled with contaminated sorbants. According to Ms. McCullom the contaminated sorbants have been tested and are not RCRA regulated hazardous waste. The contaminated sorbants are incinerated by Environmental Systems, Inc. (ESI) located in North Pole, Alaska. No hazardous waste accumulation areas were observed in this area.

We next visited Tank 192, the facilities main oil/water separator, **Photo #4**. This is not the original Tank 192 addressed in the EPA Orders. The original tank was cleaned and dismantled in July 1989 and this new replacement tank was constructed.

The Effluent Building is located next to Tank 192. Sump 905 is located inside this building, **Photo #5**. According to Ms. McCullom, Sump 905 receives wastewater only from the Effluent Building floor drains. Because of this, Ms. McCullom believes that including this sump as a hazardous waste management unit requiring closure in the EPA Orders was a mistake.

Enroute to the main hazardous waste accumulation area we observed MW 123. MW 123 is located between Crude Unit #1 and Lagoon B. According to Ms. McCullom approximately 100 ppb benzene has been detected in the groundwater from this well. We also observed MW 107 and Sump 909b between Lagoon B & Lagoon C. Sump 909b is depicted in **Photo #6**. Benzene has been detected at 5-50 ppb in MW 107. Groundwater from MW 109 which is situated immediately to the West of Lagoon B contains 5-50 ppb, according to Ms. McCullom.

The main hazardous waste accumulation area is located adjacent to Lagoons B & C and next to the fire training area, **Photo #7**. Mr. Kany questioned why the hazardous waste accumulation area is in such close proximity to the fire training area. Ms. McCullom said she would discuss the issue with MAPI's Safety Officer and that they would ensure the fire training activities occurred in a safe manner. The hazardous waste accumulation area is a concrete lined and diked area surrounded by a chainlink fence. A blind concrete sump is in the center of the accumulation area and was filled with water. Ms. McCullom stated that the sump is pumped out on an as needed basis and discharged to Tank 192. The inspectors observed 2 1/2 drums of K050, 1 drum of F037, 3 drums of desalter sludge (D001 & D018) and 4 drums of non-RCRA spent SulfaTreat in the fenced area. All of the drums were labeled with the words "Hazardous Waste" and had accumulation start dates ranging from 5/16/94 - 5/20/94. Ms. McCullom stated that MAPI has determined the SulfaTreat is not a regulated hazardous waste based on product knowledge, **Appendix B**. Ms. McCullom also stated that the accumulation area is inspected by Ms. Brodie on a weekly basis, however, a written inspection log is not kept. The inspectors encouraged Ms. McCullom to maintain a written inspection log as evidence that inspections are being conducted at least weekly, although a written log is not required by regulation for generators.

We next observed Lagoon C, **Photos #8 & #9**. Part of Lagoon C was constructed on top of the southern portion of the boneyard where illegal hazardous waste storage was observed during the 1987 CEI. MWs 111, 112, and 113 are on the western and northern perimeter of the boneyard. According to Ms. McCullom benzene has been detected in all of these MW at approximately 100 ppb. Minimal soil staining was observed in the boneyard, **Photo #10**. Soil staining was caused by present day activities and not by the hazardous waste storage observed during the 1987 CEI.

Enroute to MAPI's laboratory we observed the rail loading facility and recovery well #21. Soil staining was observed in the railbed, **Photos #11 & 12**. A vapor recovery system has been installed at the rail loading facility. **Photo #13** depicts recovery well #21.

Outside of the laboratory we observed the <90 day accumulation area for waste mercury generated mainly from broken thermometers. The container was labeled as required by 40 CFR 262.34(a)(3) & (4). We also observed several flammable cabinets



containing QC petroleum product samples. These samples are retained for specified time periods and then placed into the sump adjacent to the lab. This sump leads to Tank 192. During our tour of the laboratory, Mr. Lonney Head/ MAPI's Laboratory QC Superintendent, stated that approximately 5-10 gallons per day of samples are placed in the sump. Additionally, all spent solvents, such as toluene, hexane, kerosene, methanol, xylene and neutralized acids are placed in the sump. Ms. McCullom claimed that the laboratory wastewater is approximately 1.1% of the total refinery wastewater flow or approximately 40 gallons per minute and therefore meets the 40 CFR 261.3(a)(2)(iv)(E) exemption. North Pole's POTW is regulated under the Clean Water Act and MAPI's Lagoon C effluent is subject to pretreatment standards. **Appendix C** shows Ms. McCullom's calculations for determining the flowrate. Additionally, QC sample purging activities meet the 40 CFR 261.3(a)(2)(iv)(D) exemption.

We next visited the air stripping towers used to treat contaminated groundwater generated from MAPI's pump and treat program, **Photo #14**. Treated water is directly discharged to a small holding pond prior to being discharged to a leachfield system or to two gravel pits adjacent to the wastewater lagoons. **Photo #15** depicts the holding pond. Ms. McCullom stated that the holding pond and leachfield injection system is exempt from hazardous waste regulation by 40 CFR 261.4(b)(11). This exemption is presently moot since wastewater discharged from the air strippers contains <5ppb Benzene and LDR regulatory levels have not been designated for D018 yet.

#### **Closeout Discussion:**

The inspectors held a close out discussion with Ms. McCullom and Mr. David Rowse at approximately 4:30 p.m. The facility representatives were informed that it appeared MAPI was in compliance with the applicable hazardous waste regulations, however, the inspectors would research the laboratory wastewater exemption to ensure MAPI met the requirements.

The inspectors left the facility at approximately 4:50 p.m. on May 27, 1994.

#### **Waste Minimization:**

MAPI has made efforts to reduce the amount and toxicity of waste generated on-site. These efforts include: eliminating the use of chlorinated solvents on-site; marketing used oil to be burned for energy recovery; and treating process wastewater and groundwater in air stripping units.

### **Conclusions:**

Under normal operating conditions MAPI is a SQG, however, due to turnaround the facility is subject to the LQG requirements during May 1994.

Upon closer review of the 40 CFR 261.3(a)(2)(iv)(D) & (E) wastewater exemption, it appears that MAPI is operating within the exemption requirements.

The portions of the facility and records reviewed during this inspection appear to be in compliance with the applicable State and Federal hazardous waste regulations.

The 3008(a) and 3008(h) EPA Orders are still in place. EPA may elect to terminate the 3008(a) Order since the Public Notice period has closed for the Closure Plans and they were approved by EPA in a June 30, 1994 letter. The 3008(h) Order may also be terminated, modified, or referred to State authorities at this juncture in time, although the CMS has not been conducted. The EPA could substantially modify the 3008(h) Order to turn it into a CMI 3008(h) Order with MAPI's pump and treat remedy as the approved technology.

It appears that Tank 192, Lagoon B, the Boneyard, and Sumps 901, 905, 909b, and 05-7 have been closed according to MAPI's recently approved closure plans.



## List of Appendixes and Attachments

Appendix A - Photographic Log

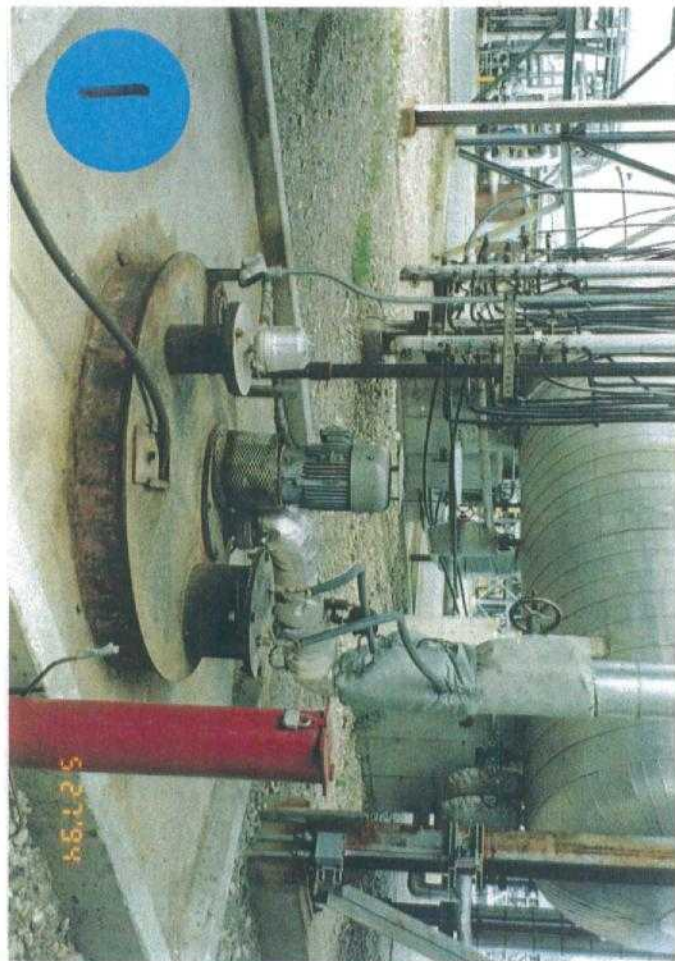
Appendix B - SulfaTreat Documentation

Appendix C - MAPI's Laboratory Wastewater Flow Calculations

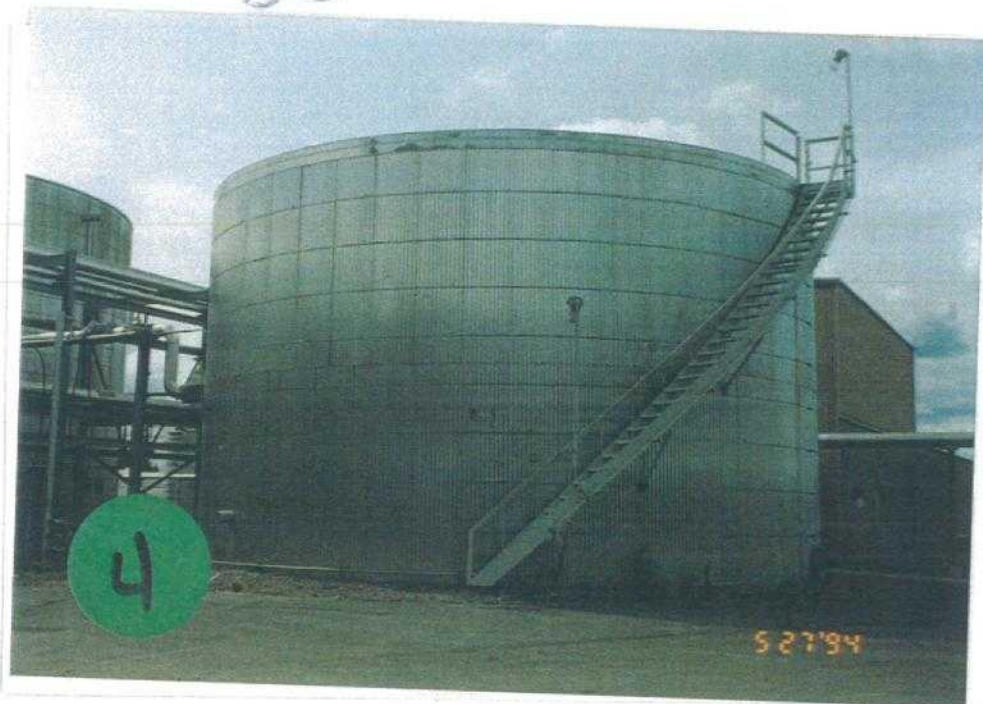
Attachment #1 - Inspection Checklist

**APPENDIX A**  
**PHOTOGRAPHIC LOG**

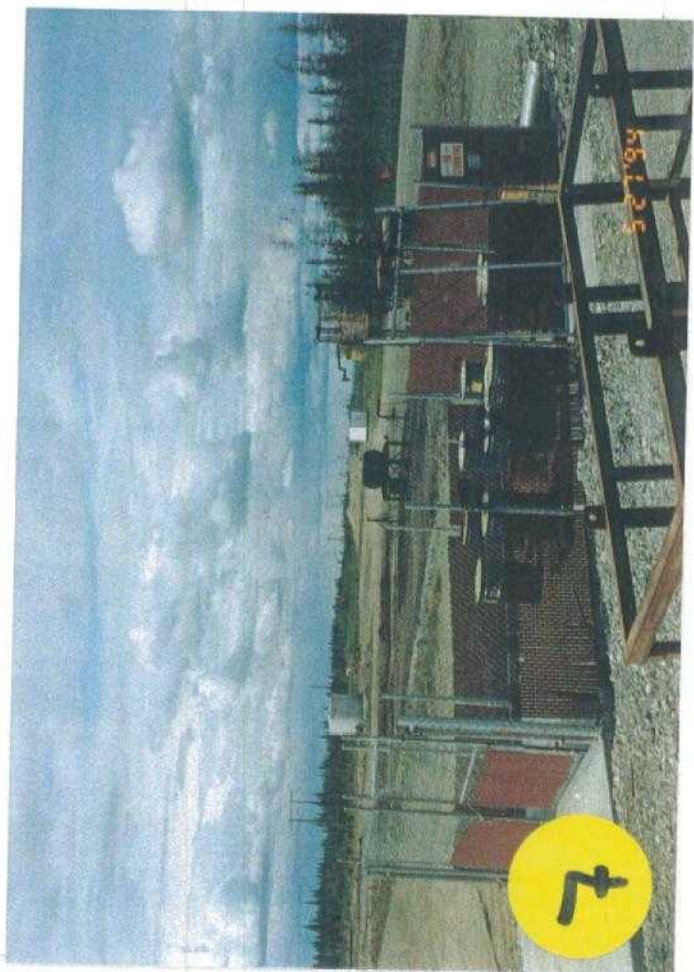




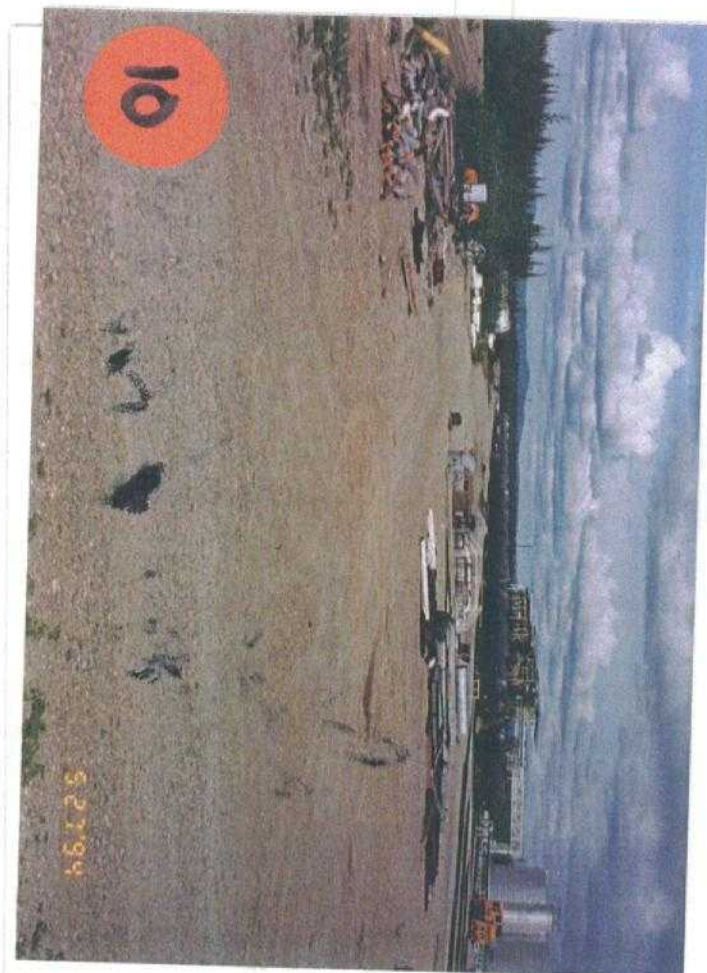




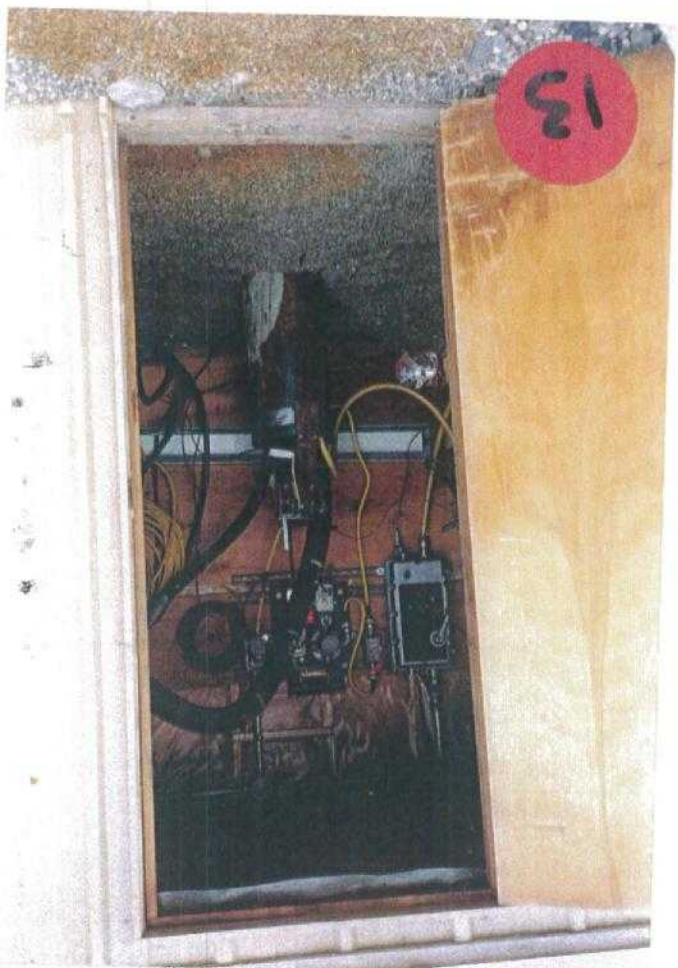
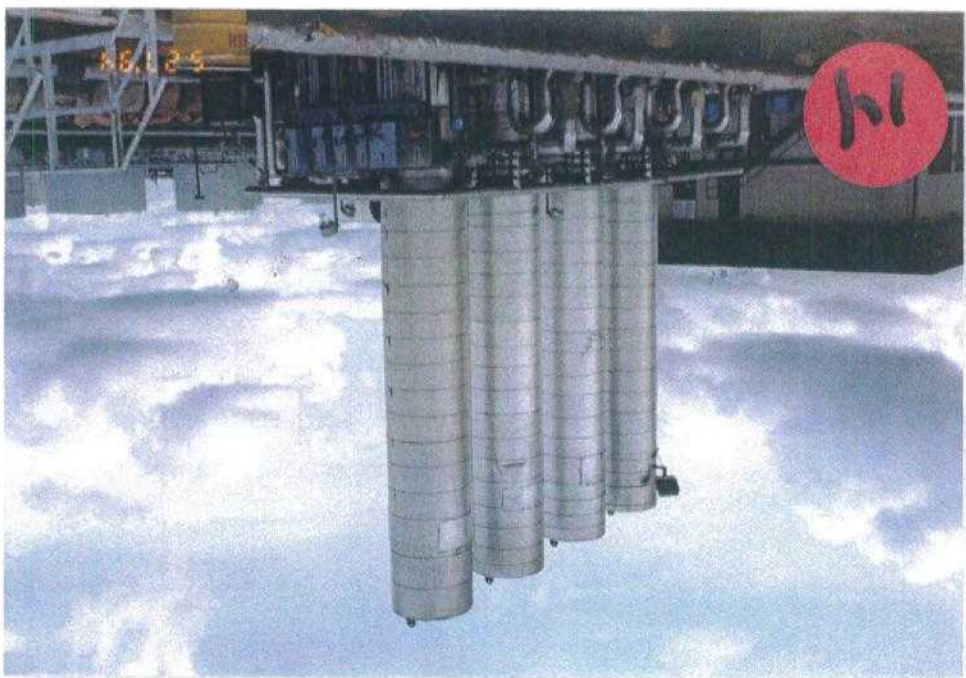
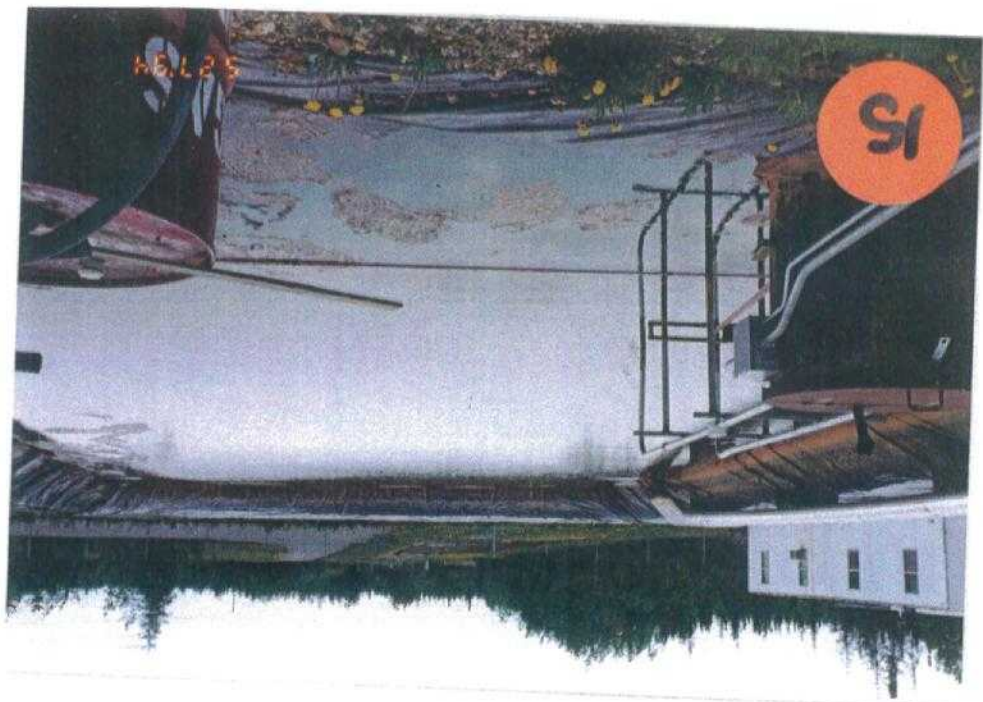












## PHOTOGRAPHIC LOG

<u>Photo Number</u>	<u>Description</u>
1	Sump 05-9 and monitoring well 115
2	Sump 901 and monitoring well 116
3	Crude Unit #1: Process skid trenches containing F037
4	Tank 192
5	Effluent Building: Sump 905
6	Sump 909b
7	Main hazardous waste accumulation area with fire training area in the background.
8	Lagoon C: photo towards southeastern direction
9	Lagoon C: photo towards southern direction
10	Boneyard
11	Railbed near rail loading facility: stained soils
12	Railbed near rail loading facility: stained soils
13	Recovery well #21
14	Groundwater air stripping towers
15	Treated groundwater holding pond



**APPENDIX B**  
**SULFATREAT DOCUMENTATION**

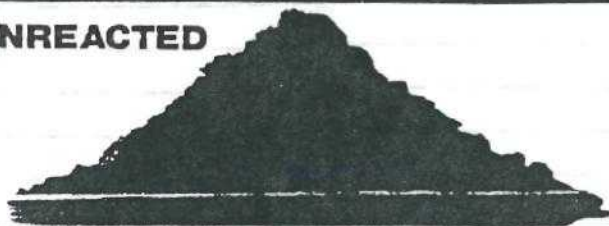
# SulfaTreat<sup>®</sup>... *the next generation*

## What is SulfaTreat.® ?

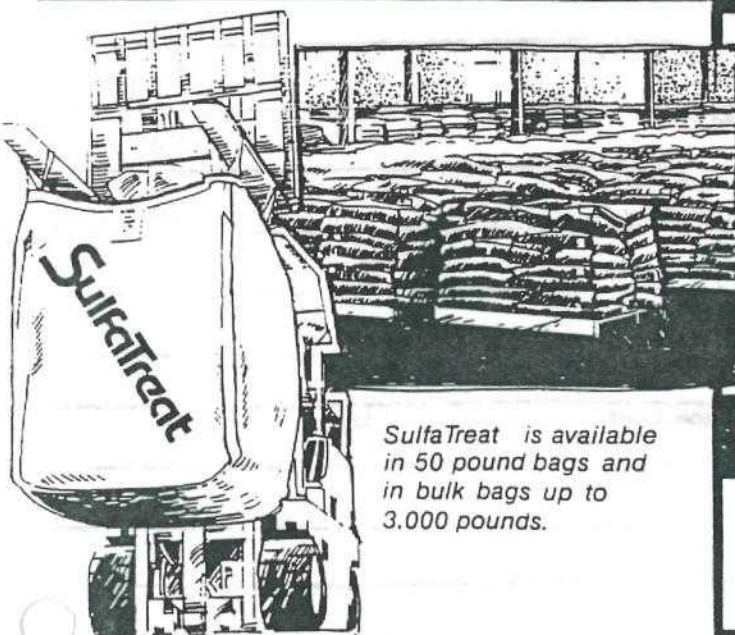
SulfaTreat is a substantially dry, free-flowing material which is used in a patented and patent pending batch type process for selectively removing hydrogen sulfide gas ( $H_2S$ ), mercaptans (RSH) and other sulfur containing gases from natural gas.

SulfaTreat is non-toxic, non-hazardous, non-ignitable and environmentally safe in both its unreacted and ready-for-disposal forms as determined under EPA regulations. SulfaTreat offers substantial benefits over other batch type processes.

**UNREACTED**



**SPENT**



SulfaTreat is available in 50 pound bags and in bulk bags up to 3,000 pounds.

## What are the benefits of SulfaTreat.® ?

### Low cost

When considering product, changeout and disposal costs, SulfaTreat costs less per pound of  $H_2S$  removed than iron sponge, Sulfa-Check and other batch processes.

### Longer Life

Each batch removes 3 to 5 times more  $H_2S$  than iron sponge, so, there is longer time between changeouts.

### Environmentally safe

SulfaTreat, in both its unreacted and ready-for-disposal forms, meets EPA guidelines for classification as non-toxic, non-hazardous waste.

### Safe changeouts

There is no evidence of smoldering during the changeout process as with iron sponge.

### Quick and easy changeouts

When reacted, SulfaTreat does not become cemented, thereby reducing the time needed for changeouts. SulfaTreat changes-out in 2-4 hours from start to finish, as compared to days for iron sponge.

### Predictable

SulfaTreat has computerized predictability, which allows users to plan and budget changeouts.

### No toxic or corrosive gases

Generates no toxic or corrosive gases, unlike Sulfa-check or iron sponge. No  $NO_x$  or carbonate scale is generated. Pyrite is the primary product of reaction.

# Unequaled in performance



**Material Safety Data Sheet**

May be used to comply with  
OSHA's Hazard Communication Standard,  
29 CFR 1910.1200. Standard must be  
consulted for specific requirements.

**U.S. Department of Labor**

Occupational Safety and Health Administration  
(Non-Mandatory Form)  
Form Approved  
OMB No. 1218-0072



IDENTITY (As Used on Label and List)  
**Sulfaircat**

Note: Blank spaces are not permitted. If any item is not applicable, or no  
information is available, the space must be marked to indicate that.

**Section I**

Manufacturer's Name <b>Gas Sweetener Associates, Inc.</b>	Emergency Telephone Number <b>504-836-5986 or 314-532-2211</b>
Address (Number, Street, City, State, and ZIP Code) <b>900 Roosevelt Pkwy, Suite 610</b>	Telephone Number for Information <b>314-532-2211</b>
<b>Chesterfield, MO 63017</b>	Date Prepared <b>August 17, 1990</b>
	Signature of Preparer (optional)

**Section II — Hazardous Ingredients/Identity Information**

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
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**None**

**Section III — Physical/Chemical Characteristics**

Boiling Point	<b>NA</b>	Specific Gravity (H <sub>2</sub> O = 1)	<b>1.12</b>
Vapor Pressure (mm Hg.)	<b>NA</b>	Melting Point	<b>NA</b>
Vapor Density (AIR = 1)	<b>NA</b>	Evaporation Rate (Butyl Acetate = 1)	<b>NA</b>
Solubility in Water <b>Not Soluble</b>			
Appearance and Odor <b>Black granular odorless powder</b>			

**Section IV — Fire and Explosion Hazard Data**

Flash Point (Method Used) <b>NA</b>	Flammable Limits <b>NA</b>	LEL	UEL
Extinguishing Media <b>NA</b>			
Special Fire Fighting Procedures <b>None</b>			

Unusual Fire and Explosion Hazards  
**None**

**Section V — Reactivity Data**

Stability	Unstable	Conditions to Avoid
	Stable	NA

Incompatibility (Materials to Avoid)

Material is inert. None known.

Hazardous Decomposition or Byproducts

None

Hazardous Polymerization	May Occur	Conditions to Avoid
	Will Not Occur	NA

**Section VI — Health Hazard Data**

Route(s) of Entry:                      Inhalation?                      Skin?                      Ingestion?

   Yes                      No                      No

Health Hazards (Acute and Chronic)

None

Carcinogenicity:                      NTP?                      IARC Monographs?                      OSHA Regulated?

   No                      No                      No

Signs and Symptoms of Exposure

None

Medical Conditions

Generally Aggravated by Exposure None

Emergency and First Aid Procedures

None required

**Section VII — Precautions for Safe Handling and Use**

Steps to Be Taken in Case Material is Released or Spilled

No special precautions required.

Waste Disposal Method

As required by local laws. Product is classified as non-hazardous using EPA guidelines.

Precautions to Be Taken in Handling and Storing

None required

Other Precautions

None

**Section VIII — Control Measures**

Respiratory Protection (Specify Type)

Dust mask

Ventilation	Local Exhaust	Special
	NA	NA
	Mechanical (General)	Other
	NA	NA

Protective Gloves

None required

Eye Protection

Goggles

Other Protective Clothing or Equipment

None required

Work/Hygienic Practices

Avoid dust irritation.



**EVALUATION OF THE ENVIRONMENTAL CHARACTERISTICS  
OF SulfaTreat<sup>™</sup> AND ITS REACTION PRODUCTS  
USING EPA GUIDELINES FOR THE  
"IDENTIFICATION AND LISTING OF HAZARDOUS WASTE"  
MARCH, 1992**

**I. SUMMARY**

SulfaTreat<sup>™</sup> is used in a patented process which consists of the use of a proprietary iron compound to remove hydrogen sulfide from natural gas. As a result of the process, a solid residue is produced.

Laboratory evaluations were performed on SulfaTreat<sup>™</sup> and its air dried reaction products according to U.S. Environmental Protection Agency (EPA) test protocol cited in 40 CFR Subpart C (Section 261.20 through 261.24) of Section 3001 of the Resource Conservation and Recovery Act in the Federal Register, Volume 45, Number 98, on May 19, 1980, revised July 1, 1989 and the Toxicity Characteristics Leaching Procedure (TCLP) effective September 2, 1990. Reacted SulfaTreat was also analyzed according to extractable California title 22 methods using the calwet extraction procedure.

Evaluations included testing of the ignitability, corrosivity, reactivity, and the determination of the presence of heavy metals and pesticides as prescribed in the regulations.

Also the oral and dermal toxicity and the aquatic 96 hour LC50 was determined and the agricultural characteristics were studied. All results showed SulfaTreat<sup>™</sup> and its reaction products to be safe for personnel and non-hazardous to the environment and effective for plant growth.

The work summarized herein was performed for Gas Sweetener Associates by the following companies and individuals:

**EPA:**

Gulf South Research Institute (GSRI)  
Shilstone Testing Laboratories  
Tim Sloan, Scientific Consultant  
Dr. R. P. Wendt, Professor of  
Chemistry, Loyola University  
Thermo Analytical Inc.  
SPL, Inc.

**ORAL AND DERMAL TOXICITY:**

Scientific Associates, Inc.

**CORN GROWTH EXPERIMENTS:**

Terry L. Smith, Ph.D., California  
Polytechnic State University, Soil  
Science Department.

**II. EXPERIMENTAL RESULTS****A. Characteristics of Ignitability**

The residue is not a liquid. Flash point of wet sludge - Does not flash below 100 C. Flash point of dry sludge - 137 C.

**1. Friction Testing**

Friction testing was conducted by grinding the sample under standard temperature and pressure in a mortar and pestle and monitoring the temperature. There was neither ignition nor any variation in the temperature or cause of fire during the course of the evaluation.

**2. Flame Testing**

Flame testing was conducted by 1) directly heating the sample with a Fischer burner flame and 2) indirectly heating the sample in a porcelain crucible. In both cases, the sample did not ignite but merely glowed with red color due to high temperature.

**3. Exposure to Moisture Testing**

Exposure to moisture testing was conducted by placing small amounts of the sample in water. The sample remained unchanged.

**4. Oxidizer**

By the definition stated in 49 CFR 173.141, the sample is not an oxidizer.

**B. Characteristics of Corrosivity****1. pH Determination**

The pH determination was made on a slurried sample in accordance with EPA 600/4.79-020. The initial pH reading was approximately 9.

**2. Corrosion Rate Determination**

The corrosion rate of the sample on 1020 steel was determined using a potentiodynamic polarization technique (ASTM G-5 specification). The studies were conducted using a Princeton Applied Research computerized Model 350 corrosion measurement system.

The results of the potentiodynamic polarization experiment with SAE 1020 steel showed that the general corrosion rate at 455C (130°F) of 5.8 mils (.15 mm) per year is substantially below the maximum 0.250 inches (6.25 mm) per year specified in the regulation.

C. Characteristics of Reactivity1. Stability Testing

An aqueous suspension of the reacted SulfaTreat<sub>tm</sub> monitored with a potentiometer from pH 1 to pH 12.5. The pH alterations were accomplished using dilute HCL and dilute NaOH. The material was stable and totally unreactive when exposed to these pH extremes without any evolution of gases, including H<sub>2</sub>S and SO<sub>2</sub>.

2. Classification as an Explosive

Neither the material nor anything similar to this material is listed as a Forbidden, Class A, or Class B explosive in 49 CFR 173.51, 49 CFR 173.53, or 49 CFR 173.88.

D. Characteristics of EP Toxicity

Laboratory evaluations of the EP toxicity required a leaching step prior to analysis. The leaching step was carried out in accordance with the test methods described within the Federal Register, Volume 45, Number 98 on May 19, 1980 (Appendix III). 100 grams of the ground solid sample were placed in a mechanically stirred extractor with 1600 g of deionized water. The pH was maintained at 5 for a period of 24 hours by the addition of 0.5 N acetic acid at 30 minute intervals as needed. This solution was then filtered using a 0.45 millipore filter. The filtrate was analyzed for the presence of contaminants using the following EPA methods:

Contaminant	EPA Method
Mercury	245.1
Arsenic	206.1
Barium	208.1
Cadmium	213.1
Chromium	218.1
Lead	239.2
Selenium	270.3
Silver	272.1
Mercury	245.1
TCLP	1311

The concentration of contaminants in the extract is far below the maximum allowable limits in all cases.

E. Oral and Dermal Toxicity1. Unreacted SulfaTreat<sub>tm</sub> (Oral Toxicity)

The acute oral LD 50 of SulfaTreat<sub>tm</sub> when administered as a 67% w/w aqueous suspension to male and female SASCO rats weighing 219 to 345 grams, was found to be greater than 39.91 g/kg of body weight.

As the term is defined in the Federal Hazardous Substances Act (FHSA), the product was found not to be a Toxic Substance.

2. Reacted SulfaTreat<sub>tm</sub> (Oral Toxicity)

Undiluted, reacted SulfaTreat<sub>tm</sub> (semisolid phase) was administered orally to ten SASCO-SD rats (five male and five females), weighing 198 to 265 grams at a dosage level of 5.00 grams per kilogram of body weight. All of the animals survived dosage and the fourteen-day observation period which followed. As the term is defined in the Federal Hazardous Substance Act (FHSA), the semisolid phase of the test material was found not to be a Toxic Substance.

3. Reacted SulfaTreat<sub>tm</sub> (Dermal Toxicity)

Undiluted, reacted SulfaTreat<sub>tm</sub> (liquid phase) was applied for twenty-four hours to the abraded skin of five male and five female New Zealand White Rabbits, weighing 2.72 to 3.09 kilograms, at a dosage level of 2.00 grams per kilogram of body weight. All ten animals survived dosage and the fourteen-day observation period which followed. As the term is defined in the Federal Hazardous Substances Act (FHSA), the liquid phase of the test material was found not to be a Toxic Substance.

4. Reacted SulfaTreat (Aquatic Toxicity)

Passed the aquatic 96 hour LC50 which was determined to be more than 500 milligrams per liter when measured in soft water with fathead minnows.

F. Corn Growth Experiments

In concentrations of 5000 lbs per acre reacted SulfaTreat increased the growth rate of corn by 69% in sandy soils and 26% in clayey soils. SulfaTreat did not lower the soil pH. "Reacted SulfaTreat has been very beneficial for plant growth". "Yield responses are tremendous."

A follow-up study reported that 30,000 lbs. per acre of reacted SulfaTreat resulted in a 135 percent increase in the dry grain weight of barley grown in clayey soils.

G. Other

The material is not listed (as a hazardous waste) in Subpart 261.30-261.33 of "Identification and Listing of Hazardous Wastes," EPA-8700-12(FR), May 29, 1980.



## **APPENDIX C**

### **MAPI'S LABORATORY WASTEWATER FLOW CALCUATIONS**

imp pump off:

Time Start = 11:00 AM Depth 5'4" total  
4'6" water

imp pump on:

Time End = 5:30 PM Depth 6'6" total  
5'8" water

Net gain (total flow) = 1'2" or 14"  
(Net water gain - couldn't measure hydrocarbon gain)

Diameter of tank = 60"  
 $r = 30"$

$$\text{Area} = \pi r^2 = 3.14 \times (30)^2 = 2826 \text{ square inches}$$

$$\begin{aligned} \text{Cubic inches of volume} &= \text{Area} \times \Delta h \text{ (change in depth)} \\ &= 2826 \text{ in}^2 \times 14 \text{ in} \\ &= 39564 \text{ in}^3 \end{aligned}$$

$$39564 \text{ in}^3 \times \frac{1 \text{ gallon}}{231 \text{ in}^3} = 171.3 \text{ gallons} / 6 \frac{1}{2} \text{ hrs}$$

$$\frac{171.3 \text{ gallons}}{6.5 \text{ hrs}} = \frac{632 \text{ gallons}}{24 \text{ hrs}} \quad \left( \frac{24 \times 171.3}{6.5} \right) = 632 \text{ gallons}$$

Result: 632 gallons / day or 4,424 gallons / week  
or  $\approx 0.44$  gallons / minute

1.1 % refinery wastewater flow

$\therefore \sim 40$  gallons / minute



**ATTACHMENT #1**  
**INSPECTION CHECKLIST**

Mapco CET  
May 27, 1994

## 4. Containers Checklist

Section A - Use and Management (§§264/5.171)

Yes No

1. Are containers in good condition?

X —Section B - Compatibility of Waste With Container (§§264/5.172)

1. Is container made of a material that will not react with the waste which it stores?

X —Section C - Management of Containers (§§264/5.173)

1. Is container always closed while holding hazardous waste?
- 
2. Is container not opened, handled, or stored in a manner which may rupture it or cause it to leak?

X —X —Section D - Inspections (§§264/5.174)

1. Does owner/operator inspect containers at least weekly for leaks and deterioration?

But no written documentation X —Section E - Containment (§264.175)

1. Do container storage areas have a containment system?

X —Section F - Ignitable and Reactive Waste (§§264/5.176)

1. Are containers holding ignitable and reactive waste located at least 15 m (50 ft) from facility property lines?

X —Section G - Incompatible Waste (§§264/5.177)

1. Are incompatible wastes or materials placed in the same containers?
- 
2. Are hazardous wastes placed in washed, clean containers when they previously held incompatible waste? not assessed
- 
3. Are incompatible hazardous wastes separated from each other by a berm, dike, wall, or other device? no incompatibles in storage area

— X

— —

— —

Section H - Closure (§264.178)

1. At closure, were all hazardous wastes and associated residues removed from the containment system? n/a

— —



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5. Generators Checklist

---

Section A - EPA Identification No.

Yes      No

1. Does generator have EPA I.D. No.? (§262.12)

X          a. If yes, EPA I.D. No. AKD 00085 0701Section B - Manifest

1. Does generator ship waste off-site? (§262.20)

X          

a. If no, do not fill out Sections B and D.

b. If yes, identify primary off-site facility(s). Use narrative explanation sheet.

2. Does generator use manifest? (§262.20)

X          

a. If no, is generator a small quantity generator (generating between 100 and 1000 kg/month?)

NOTE: SQGs are only exempt if wastes are reclaimed. (See §262.20(e).)

1. If yes, does generator indicate this when sending waste to a TSD facility?

b. If yes, does manifest include the following information? (Part 262 appendix)		Yes	No
1.	Manifest document no.	<u>X</u>	—
2.	Generator's name, mailing address, telephone no.	<u>X</u>	—
3.	Generator EPA I.D. no.	<u>X</u>	—
4.	Transporter Name(s) and EPA I.D. no.(s)	<u>X</u>	—
5.	a. Facility name, address, and EPA I.D. no.	<u>X</u>	<u>X</u>
	b. Alternate facility name, address, and EPA I.D. no.	—	<u>X</u>
	c. Instructions to return to generator if undeliverable	<u>X</u>	—
6.	Waste information required by DOE - shipping name, quantity (weight or vol.), containers (type and number)	<u>X</u>	—
7.	Emergency information (optional) (special handling instructions, telephone no.)	<u>X</u>	—
8.	Is the following certification on each manifest form?  "This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable national and international regulations."	<u>X</u>	—
9.	Does generator retain copies of manifests? (\$262.40)  If yes, complete a through e. (\$262.23)	<u>X</u>	—



- |  |  | Yes      | No          |
|--|--|----------|-------------|
| a.   | 1. Did generator sign and date all manifests?  | <u>X</u> | <u>    </u> |
|  | 2. Who signed for generator?   |          |             |
| Name <u>K. McWilliam</u> Title <u>Environmental Supervisor</u> |  |          |             |
| b.   | 1. Did generator obtain handwritten signature and date of acceptance from initial transporter?             | <u>X</u> | <u>    </u> |
|  | 2. Who signed and dated for transporter? (§262.23)   |          |             |
| Name <u>Varies</u> Title <u>    </u>                           |  |          |             |
| c.   | Does generator retain one copy of manifest signed by generator and initial transporter? (§262.40)          | <u>X</u> | <u>    </u> |
| d.   | Do returned copies of manifest include facility owner/operator signature and date of acceptance? (§262.40) | <u>X</u> | <u>    </u> |
| e.   | Does generator retain copies for 3 years? (§262.40)  | <u>X</u> | <u>    </u> |

**Section C - Hazardous Waste Determination (40 CFR 262.11)**

- |    |   |          |             |
|----|---|----------|-------------|
| 1. | Does generator generate solid waste(s) listed in Subpart D (List of Hazardous Waste)?   | <u>X</u> | <u>    </u> |
| a. | If yes, list wastes and quantities (include EPA Hazardous Waste No.) <u>See annual report</u>   |          |             |
| 2. | Does generator generate solid waste(s) listed in Subpart C that exhibit hazardous characteristics (corrosivity, ignitability, reactivity, EP toxicity)? | <u>X</u> | <u>    </u> |
| a. | If yes, list wastes and quantities (include EPA Hazardous Waste No.) <u>See annual report</u>   |          |             |
| b. | Does generator determine characteristics by testing or by applying knowledge of processes? <u>Both</u>  |          |             |

	Yes	No
1. If determined by testing, did generator use test methods in Part 261, Subpart C (or equivalent)?	<u>X</u>	—
a. If equivalent test methods used, attach copy of equivalent methods used.		
3. Are there any other solid wastes generated by generators?	<u>X</u>	—
a. If yes, did generator test all wastes to determine whether or not they were hazardous?	<u>X</u>	—
1. If no, list wastes and quantities deemed nonhazardous or processes from which nonhazardous waste was produced (use additional sheet if necessary)		
<u>Use testing &amp; knowledge</u>		

**Section D - Pretransport Requirements**

1. Does generator package waste in accordance with 49 CFR 173, 178, and 179 (DOT requirements)? (§262.30)	<u>X</u>	—
2. a. Are containers to be shipped leaking or corroding?	—	<u>X</u>
b. Use additional sheet to describe containers and condition.		
c. Is there evidence of heat generation from incompatible wastes in the containers?	—	<u>X</u>
3. Does generator follow DOT labeling requirements in accordance with 49 CFR 172? (§262.31)	<u>X</u>	—
4. Does generator mark each package in accordance with 49 CFR 172? (§262.32)	<u>X</u>	—
5. Is each container of 110 gallons or less marked with the following label? (§262.32)	<u>X</u>	—

Label saying: HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator name(s) and address(es) \_\_\_\_\_

Manifest document No. \_\_\_\_\_

6. Does generator have placards to offer to transporters? (§262.33)	—	—
	not assessed	



- |       |   | Yes | No |
|-------|---|-----|----|
| 7.    | Accumulation time (§262.34)   | —   | —  |
| a.    | Are containers used to temporarily store waste before transport?  | —   | —  |
| 1.    | If yes, is each container clearly dated: Also, fill out rest of No. 7 (accum. time) (§262.34(a)(2))   | X   | —  |
| b.    | 1. Does generator inspect containers for leakage or corrosions? (§265.174 - Inspections)  | X   | —  |
|       | 2. If yes, with what frequency? <i>weekly</i>   | X   | —  |
| c.    | Does generator locate containers holding ignitable or reactive waste at least 15 meters (50 Feet) from the facility's property line? (§265.176 - Special Requirements for Ignitable or Reactive Wastes) | X   | —  |
| NOTE: | If tanks are used, fill out checklist for tanks. (See RCRA Hazardous Waste Tank Systems Inspection Manual, OSWER Dir. No. 9938.4)   |     |    |
| d.    | Are the containers labeled and marked in accordance with Sections D-3, -4, and -5 of this form?   | X   | —  |
| NOTE: | If generator accumulates waste on site, fill out checklist for General Facilities, Subparts C and D.  |     |    |
| e.    | Does generator comply with requirements for personnel training? (Attach checklist for §265.16 - Personnel Training.)  | X   | —  |
| 8.    | Describe storage area. Use photos and narrative explanation sheet.  |     |    |

**Section E - Recordkeeping and Records (40 CFR 262.40)**

- |       |  |  |   |
|-------|--|--|---|
| 1.    | Does generator keep the following reports for 3 years? |  |   |
| a.    | Manifest or signed copies from designated facilities   | /  | — |
| b.    | Biennial reports                                       | /  | — |
| c.    | Exception reports                                      | /  | — |
| d.    | Test results   | /  | — |
| 2.    | Where are the records kept (at facility or elsewhere)? | —  | — |
| 3.    | Who is in charge of keeping the records?               | <i>McWilliams Office / main facility</i> |   |
| Name  | <i>McWilliams, Kathleen</i>                            |  |   |
| Title | <i>Environmental Supervisor</i>                        |  |   |

Section F - Special Conditions

N/A

- |    |   | Yes | No |
|----|---|-----|----|
| 1. | Has the primary exporter received from or transported to a foreign source any hazardous waste?                    | —   | —  |
| a. | If yes, has he filed a notice with the Regional Administrator? (§262.53)  | —   | —  |
| b. | Is this waste manifested and signed by a foreign consignee? (§262.54)   | —   | —  |
| c. | If generator transported wastes out of the country, has he received confirmation of delivered shipment? (§262.54) | —   | —  |



## 6. Ground-Water Monitoring Checklist

### Section A - Monitoring System (40 CFR Parts 264/5 Subpart F)

	Yes	No
1. Does the facility have a ground-water monitoring system in operation? (§265.90)	—	—
a. If yes, does the system consist of: (§265.91)		
1. Minimally one upgradient monitoring well? (Part 265)	—	—
2. Minimally three downgradient monitoring wells? (Part 265)	—	—
b. Are monitoring wells cased so that the integrity of the boreholes is maintained? (§265.91)	—	—
c. Is a compliance monitoring system installed whenever hazardous waste constituents are detected at the compliance point? (§264.92)	—	—
d. Is a corrective-action program initiated whenever the ground-water protection standard is exceeded? (§264.100(c))	—	—
e. Is a detection monitoring program instituted in all other cases? (§264.98)	—	—
2. Does the facility have a monitoring and response program? (Part 264)	—	—
a. If yes, is a compliance monitoring system instituted whenever hazardous constituents are detected at the compliance point? (§264.99)	—	—
b. Whenever the ground-water protection standard is exceeded, does facility institute a corrective-action program? (§264.99)	—	—
c. In all other cases, does the facility institute a detection monitoring program? (§264.99)	—	—

### Section B - Sampling and Analysis (40 CFR 265.92)

1. Does the facility obtain and analyze samples from the ground-water monitoring system? (§265.92(a))	—	—
2. Has facility developed and followed a ground-water sampling and analysis plan? (§265.92(a))	—	—